The Mystery of Ryoanji in Nagi
——Arakawa + Gins or Autopoiesis

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One of the outstanding masterpieces of the Arakawa + Gins oeuvre is Nagi's Ryoanji. It is located in Nagi, which is situated in Okayama prefecture in Western Japan. This work continues to harbor riddles, despite the many attempts that have been made to interpret and decipher it. Moreover, these riddles are perhaps ones that the makers of this work themselves could neither solve nor analyze. In general, a produced work transcends the intention of the person or persons that produce it. We see something like this in the operation of technology where for example a shovel outdoes the ability of the hands digging in the ground and a bicycle outpaces the ability of the feet with regards to moving. Yet the aforementioned technological situation sheds little light on the mysteries of Nagi's Ryoanji, for what happens in Ryoanji exceeds not only the intention of the producers, but also another happening has been going on in a way similar to self organization. In this paper, I will address this problem.

Section 1 of this paper first analyzes, evaluates and clarifies what distinguished and characterized the works of Arakawa + Gins prior to their creation of Nagi's Ryoanji. To unravel Arakawa + Gins' conceptual mysteries, Section 2 then sets forth a reformulated autopoietic system theory, which differs altogether from the somewhat vague and incomplete autopoietic system theory first posited by neurophysiologists Maturana and Varela. Specifically applied to the body's movements and formations, this reformulated autopoietic system theory offers new possibilities for the self-production of meaning. Finally, section 3 of this paper revisits Nagi's Ryoanji, with this reformulated autopoietic system theory, reconsiders what really happens in Nagi's Ryoanji beyond what Arakawa + Gins designed, planned and constructed.

1 What the Arakawa + Gins' Creative Process Altered

Arakawa + Gins' conception of a production procedure resides primarily in a kind of thorough phenomenological reduction based upon the premise that any given reality might be in truth another reality once the operation of a bracketing of all reality is enacted. The conception seems, in part, dependent upon the worldview of quantum theorist Niels H. D. Bohr who insisted that reality is essentially indeterminate. It is because macro phenomena are not manifest in accord with the rules of micro phenomena that this worldview of quantum theory becomes for Arakawa + Gins a kind of metaphor, or the methodological regulative principle in similar to Kant's Kritik der Urteils Kraft. Then in so as far as all facts and phenomena perceived could be reduced under a logical possibility that another reality exists(since reality is indeterminate),

and if direct consciousness should be so reduced, it becomes immediately apparent that we would have no guide to answer the question about what the reality is. If we use such a phenomenological reduction, then in principle no basis for reality remains after the application of this kind of phenomenological reduction.

Hence, we are face with a kind of paradox. On one hand, one's consciousness can reduce reality into being another reality altogether but, on the other hand, should this consciousness be a part of another reality to begin with, then an uncertainty of what reality is would then necessarily result from this methodological reduction, and we return to ponder only uncertainty. Both the image perceived and the perception of the reality could, however, similarly be phenomenologically reduced by one's consciousness, and for Arakawa + Gins, the human body provides a means to do this. This is the second presupposition for their artistic creations.

The body offers three important peculiarities for the works of Arakawa + Gins. First, in contrast to the relative freedom of one's consciousness, the body cannot be reduced and, as far as the consciousness does not produce one's body, it is unable to produce a separate existence through the constitution of its consciousness and the operations therein. Second, the body's movements participate in, and penetrate into, all perception as an integral condition for perception. Even if human existence and the surrounding environment are produced in a different way to the actual way of production that we observe, the real body inevitably plays a role in this fabrication. Third, the body is not formed by the same processes in which conscious image-creation and perception are executed. And thus the body's peculiar mechanism suggests instead a certain need for a mechanism of self-organization or autopoiesis.

At this point, Arakawa's and Gins' third presupposition becomes clear and distinct. Given that it is possible for one reality to be another (in accord with the idea that reality is indeterminate), any work produced could, in some measure, be seen to offer up a new reality. Although Arakawa + Gins do not describe the criteria they use to formulate their new reality prototypes, through their creations they present possible frameworks or measurements for perception and image-creation. However I believe these criteria are quite different from mathematical or semiotic ones, in so far as the criteria continue to be formed in and through engagement with a world. In general, when people face new realities other than those already known, they need a new set of guidelines and rules to reckon with the unknown, e.g. coming up with the range of necessary conditions to enable an existence in an environment. Yet even if humans could conjure up a definition of life through their accumulated knowledge and intelligence, it would still be only one definition limited to the historical present. Alternatively, Arakawa + Gins intend to challenge us to accept an enactment or reference to the possibility of life that is a produced life independent of life grounded in human consciousness.

In order to understand life's meaning as something inseparable from the body's action, as part of a consideration of alternative realities, requires the maintenance of a definite

relation between perception and bodily action. This entails a certain stability and formative repetition of experience. But Arakawa + Gins' Ryoanji in Nagi offers neither stability nor the repetition of experience which is what makes it a peculiar encounter for all those who visit the site. Moreover, some mechanism must substantiate one's formative experience of the alternative reality at Nagi' Ryoanji, and I think the autopoietic system theory can elucidate just what that mechanism is. Indeed, Arakawa + Gins succeed beyond their stated intent as each visitor is left reconstructing the experience of the new reality without knowing what kind of experience is being internalized.

Generally speaking, an unknown experience appears suddenly to us when we stand in the place where experience is formed by itself. When this place is artificially produced as a kind of art, we cannot see the work only as an object, but also are forced to form our experience of seeing itself in the work at the same time. As with many of Van Gogh's works, we form the act of perception itself at the same time as we perceive the paintings. I would like to call such an operation of experience ' the double operation'. When we attempt to understand any work through the process of the double operation, we confront a clash and then a chaos of meanings where the new formation of meaning seems to destroy existing meanings, sever all meaningful contexts, suspend meaning into fragmented pieces, and sever the connection to meaning whereby it would seem the very borders of meaning have been compromised. And yet this has less to do with the indefiniteness of meaning as it does with the emerging of a new meaning from which our experience is inevitably formed.

For example, in "The Mechanism of Meaning," we confront what seems to be meaningless charts at first glance and we may well feel our perception inadequate to connect the two figures. (Refer to 1) But in performing the necessary multivariable topological conversion to compress the figure on the left's random spiral into the right figure's lower right quadrant, we can reinterpret existing meanings through a translation of an unlimited line into a finite plane. Various interpretations of what processes could be used to negotiate the distance between the two figures are possible. However, no plausible interpretations of how to perceive a solution are initially possible. As far as we can tell from the operations involved in "The Mechanism of Meaning", it is impossible to derive any meaning from the accomplished operation.

Yet it would seem that "The Mechanism of Meaning" has something to do not only with the limit of meaning or the impossibility of meaning, but also with the active formation of our own perceptions on the two figures. We are urged to form our ability to perceive within the work. Arakawa + Gins' message here seems to me to be to form or to build the ability of perception with perceiving two figures. We must both perceive it and form our perception within it, and this is a typical experience of the double operation. This chart then is both the artificial work to be perceived as an object and the place where the perception should be actually formed.

However it is important to emphasize that here we are not only dealing with some kind of indication of the place where meanings would be formed. If this was the case we would only be pointing out the locus where some form of hermeneutic circle emerges. When we make a question about the essence of speech or language, this question as such comes into existence by the speech or language. This situation is of course Heidegger's hermeneutic circle. In this way we have to be caught under speech or language to know the essence of the speech or language. Where the hermeneutic circle emerges is the place in which various meanings are formed. But this place suggests only a latent dimension of various meanings where the emergence of meanings has been previously determined and not a kind of topological space where meanings as such emerge. In this topological space produced by Arakawa + Gins, in order to understand meanings we have no choice but to form our perception itself. "The Mechanism of Meaning" is not related to the place of the semantic structure. These works demand rather both the act of actually seeing and the act of forming to see, and seeing in this case is similar to 'the perception before human beings' about which Merleau-Ponty talked in enumerating Cézanne.

Arakawa + Gins try to investigate the mechanism of the formation of experiences, especially sensation in the work entitles "To Not To Die". Sensation is a kind of movement, or at least it involves some movement according Bergson, Merleau-Ponty and Deleuze. But we can ask questions about the modes of such movement, and perhaps could provide various replies to these questions, for example something like élan vital or différenciation. It seems that Arakawa + Gins term as "Blank" the place where sensation is formed. If we reduce all phenomena in the visual field to a phenomenologically reduced extreme, then a kind of blank emerges at this point in the reduction and we become able to notice a kind of movement of sensation. It is the theme of " To Not To Die" to investigate the mode of this movement.

Something keeps moving in the blank when all objects in the visual field are bracketed. This movement is one that operates prior to space and time, and therefore prior to the coordinate system. The mode of this movement is called, 'Cleaving', in other words when the original first boundary is formed at this blank and the first properties emerge in the blank. I think that this new concept of movement is more fruitful than existing concepts, because it deals with the practical act that produces the reality, not only with some worldview with which philosophers interpret the world. Moreover, we can expand the concept by describing the mechanism of the movement within a model of self-organization. In this case this first boundary corresponds to a proto-sensation. The sensation forms its boundary even through its movement of emergence. The term cleaving is the new concept that indicates the act of forming its own domain by the delimitation of a boundary. Sensation involves two operations, that is, cognition and movement and it forms its own topological space through their operations. With respect to the cognitive function the sensation produces the boundary that divides the visible

and the invisible, the audible and the inaudible etc. The visible region is cut out from the wider wavelengths of the light, and the outside invisible region maybe approximately termed as present within ultraviolet and infrared spectrums. The range of the visible brightness is sure to be indicated by sensation. This is also one of ways to divide the space, and we could call such a space a topological space produced by the sensation. At this time, the sensation is sure to be a movement to form the boundary, and to maintain itself through a repetition of the operation. In the formation of boundary sensation there are operations of both cognition and movement. These two functions are not integrated into one function yet they are indispensable to each other. This situation is also a kind of double operation.

It is possible to see examples of double operation in the history of philosophy. These examples are generally concerned with the relation between activities with two different qualities such as movement and acknowledgment etc. If two qualitatively different activities belong to the essence of the same individual unit, the individual unit becomes something like Leibniz's monad. Where meaning is emergent from the blank, it may be said that the movement is similar to a kind of perception and that the perception is even a kind of movement. But in fact the two activities cannot be described as one function; on the contrary these two activites have an independent tendency, and the one doesn't determine the other.

The nervous system, and the immune system operate in such a way that the moving of one system is at the same time a kind of cognition too. But in this case, the operation of the system doesn't constitute its cognition, and the operation of the system is not controlled by its cognition either. The movement of the system is coherent to its cognition, and vice versa. We need in fact a detailed analysis of the relation of 'coherence' between movement and cognition. This is an issue that has as yet received little attention in current philosophical debates. The typical example given of a complex system that is said to contain both movement and cognition is the body. The body forms itself at each stage with its two different boundaries instantiated in the operations of movement and cognition. Melreau-Ponty has written in his latest work on the problem of the moving body as follows:

"For example, my body is not one mobile or moving among the mobiles or moving, I am not consciousness of its movements as a distance taken by relations to me, it sich bewegt whereas the thing are moved. This means a sort of "reflectedness" (sich bewegen), it thereby constitutes itself in itself——In a parallel way: it touches itself, sees itself. ....

The touching itself, seeing itself of the body is itself to be understood in terms of what we said of the seeing and the visible, the touching and the touchable. i.e. it is not an act, it is a being at (être á). To touch oneself, to see oneself, accordingly, is not to apprehend oneself, as an ob-ject, it is to be open to oneself, destined to oneself(narcissism)——" [1]

The properties of body with respect to movement are according to Merleau-Ponty as follows: the body (1) bewegt sich, (2) has a kind of reflexivity, and (3) continues itself in itself. With respect to cognition the properties are as follows: the body (4) is touching itself, (5) is not apprehending itself as an object, and (6) is open to itself. As far as a body operates by itself as a integrated unit, the relation of two functional operations should be inquired into. However in general, the description vis-à-vis movement can describe only the movement, and similarly the description of the cognition can describe only cognition. Perhaps though this is not solely a descriptive problem. The moving system operates only as movement and the cognitive system operates only with respect to cognition. Yet the two systems operate at the same time in a close relationship to each other. This relation is named as coherent with respect to the functional phenomena of the two systems, and then as a double operation with respect to the operational mode of the one system.

If we are to deal with these experiences in the works by Arakawa + Gins then we need a new kind of systemic phenomenological research. The two different actions relate closely each other and so to speak cooperate in such a way that the one doesn't define the other. For each action is formed in each respective circularity of operation. The cooperation of two different actions without determining each other is named in the autopoietic system theory as a 'coupling' of two systems. The cleaving is the first stage of the systemic operation of sensation and is even the necessary condition for an origination point, i.e. landing sight that brings about perception, imagination and bodily action in the continuing activity of its operation. Both the cleaving and the landing sight are fundamentally relate to the acts of life but not related to metaphysical worldviews. I would like to contrast such a conception with the idea of the realization of divergence in Deleuze's "Difference et repetition".

Deleuze has already entrusted to the word 'differentiation' a key concept of his system and it refers to the formation of sensation. When we understand a kind of unit of this movement of sensation as a minute difference, the unit could be said to be similar to the term dx of mathematical differentiation. This unit of differentiation automatically produces a difference to itself and then with it various patterns of diversity emerge in the world. A particular diversity is always in the process of endless diversification. In practice this unit is an event of reality corresponding to sensation. Therefore it is not only a limit concept or structuring principle demanded by the limit operation, but rather the unit of reality known by intuition in the sensation. This is called a kind of idea, because nothing would remain were perceptive intuition to be subtracted from this principle. If a minute difference is related to another one, this relation becomes a differential equation like dx/dy in which one difference is related to another difference.

At this point in my argument the conception I have presented is, when understood according to Deleuze's conception, a potential principle that brings diversity as it. This principle is the potential principle that brings about the diversification which

corresponds to the intuition of movement and change. There is indeed some movement that cannot be understood according to a conceptual analysis or analytical measurement. In these cases we could suppose that the idea corresponds to the unit of such a movement, for such a conception cannot be proven to be a mistake in so far as such a movement is the necessary presupposition for all falsification. Therefore, if the conception is developed, as Deleuze says, a kind of philosophical SF is created.

It is even a mechanism in which the potential is realized whether or not the operation is determined as a success or failure. Deleuze's way of dealing with this issue seems problematic. The differential equation often contains the following: dx/dy=x/y. This equation shows the relation between minute movements and the extension of the reality (length). In a word, the unit of the movement shows the relation connected with the 'length' of the reality. Realization can be technically drawn out from the unit of the movement by adding the integration operation. The problem to consider here is that as far as the differential movement involves some corporeal matter or materials, we are dealing with the substantial realization of matter through the movement and not with the realization of some spatial length as in a mathematical operation. This substantial realization cannot be designated only with terms relating to the integration of units of differences, but we must acknowledge that there is a formation of its own space, a topological space, going on. Deleuze's conception of self discusses, for example, the embryonic development and formation of forms. But it remains only a metaphorical case since it does not designate how integration is organized into higher modes of substantial realities. It seems that the conception of Deleuze falls short of providing the necessary tools here. There is no mechanism in Deleuze's thinking that forms various units in multiple dimensions. The cleaving is one of such mechanism, yet the content of cleaving is not clarified until it is related to the mechanism of self-organizing, especially autopoiesis.

Moreover, the position and the pose of each body is internal and indispensable to the appearance of meanings for perception. In other words perception has already been conditioned and determined by the position and pose of the body. When we look at the previous figure, it is certain and unavoidable that in our perception we stand at a certain distance from the figure. If we are standing too close, we cannot see the two figures connecting with 'as'. Conversely if we stand at a great distance, we cannot understand the instruction to 'Perceive A as B'. This situation applies for seeing the transformation of the figures in general; we would not be able to see the transformation of the two figures unless we were standing at a proper distance. I turn now to examine the possibility of expanding perception through changes to the field that is the body.

Various devices to induce such changes are contained in such works as the "Site of Reversible Destiny". Because only bringing about changes to perception cannot easily change the experience of perception itself, in order to remedy this we might try for example to put some load on the body so that we could feel a kind of endless depth in the

body. For instance, each operation that takes the balance of the body for or against gravity has already been ‘built into’ into the body through repeated trials and errors at the infant period. It consequently has become a memory that cannot be recalled. Therefore, finding one’s balance in relation to gravity doesn't emerge as a consideration of the consciousness when we stand on the ground. This kind of memory is a part of what Schelling called the ‘Transcendental Past’. Almost all memories built into the body belong to this transcendental past. Ones that we can recall, when we try to recall, belong to the empirical past. We see then that a memory that cannot be recalled has already been made to operate in the actions of the body. Consciousness is already too late to know the transcendental past. We can however reorganize our experience with devices that bring about some change to the layers of such sedimentary experiences. One such device is to be found in "The Site of the Place of Reversible Destiny in Yoro” in Gifu Prefecture. (Refer to 2) In entering into this work we are able to recall this transcendental past, in as far as the self-control of the consciousness is removed. There are indeed various devices at work here. For instance, the cave shaped like a U is dug into the middle of the park. After entering the cave light from the exit comes at us when we are half way through. I automatically try to change the direction of my body towards the exit. But at this moment I become aware that in front of my feet there is a deep hole in the dark, and then my whole body lurches in the opposite direction of the light. We are very surprised, and then through this lurching movement we recall suddenly what the body usually executes by itself and this device makes us notice other possibilities of the body.

It is a common presupposition for some phenomenologists and for Arakawa + Gins that the bodily act is internal to perception. But there are various degrees of this inner relation and moreover this degree is formed through new experiences. Arakawa + Gins well understand this situation and make us face another possibility, namely, the forming of our experiences. However, perception is an act to which the fact that it is an act is concealed. In addition perception involves always some degree of self-misunderstanding with respect to its act. For that reason it is necessary to investigate the essence of perception as it extends to the possibilities of bodily action.

The architecture named "Critical Resemblance House" (Refer to 3) is sited in the vicinity of the entrance of aforementioned ‘Site of the Place of Reversible Destiny’. This building has many entrances in its side, and is labyrinthine in the inside. When we enter from certain entrances, we are not usually able to go out the same way. This building is a little similar to one of the now extinct lower animals that had neither mouth nor anus, neither head nor a back and sometimes had a four or five meters long body. Moreover, in this animal type installation the chair is hung from the ceiling, and the blue sky is seen under the feet. Thus there is neither a top nor a bottom to structure perception.

Something that has neither before nor behind, and neither a right nor a left, doesn't

at first offer a constructional directionality for our movements. Therefore, our entering into and our going out from this building become like the distribution of matter that flows in a primitive animal. This movement must have a specific circuit if this primitive animal is to proceed into differentiation. Because our entering into the building and going out look like the production of such a movement, we are allowed to have the experience how the evolution of an individual develops. I can image myself as someone who is moving about in a mountainous whale, as if I were a small child. And then in these conditions of no left, right, top and bottom I would have to form my topological space with my movement within it. Surely through this I would be able to experience other possibilities of bodily action and perception.

2 Development of autopoietic system theory

These productive enactments by Arakawa + Gins are founded on a kind of science that belongs to a different tradition from the main scientific one framed by Galileo, Descartes and Newton in Europe. They exist substantially in the genealogy of not Theoria (Theory) but Poiesis (Production) according to Aristotle's methodological classification with regard to the forms of the sciences. Poiesis is the form of knowledge which human beings instantiate with their bodies and do this without a pre-defined model. It continues to exist in limited areas such as the arts and in mechanical labor in modern factories. When we understand these art works in this tradition, we can find various types of forerunners such as Goethe's theory of colors, Darwin's theory of evolution, and the self-organizing system theories of the latter half of the 20th century. In particular the theory of autopoiesis has significantly determined the conception of the empirical science of such a type of knowledge in higher-order phenomenon such as human life and mental phenomenon. This theory which was first conceived by neural physiologists Maturana and Varela is rather incomplete, and somewhat difficult to understand and apply to certain fields. I want to explain this theory and the mechanism of how it may be made pertinent to the formation of knowledge and bodily action. As a result of my explication I hope it will become clearer that the project of Arakawa + Gins operates at the highest level of the poietic sciences that repeatedly continue to reveal themselves in the contemporary research that deals with the creative and productive fields.

The first formulation of autopoiesis is defined by Maturana and Varela and then is developed by the sociologist Luhmann as a general theory of systems. The theory of autopoiesis shows the mechanism of the operation of a system, and how in the mechanism of this operation the self of the system is formed by itself. In other words this state of affairs means self production by itself (Autopoiesis). The mechanism includes a certain number of necessary conditions outlined as follows: (1) A generative process is automatically connected with a generative process that proceeds

from it. This situation arises even at the emergence of a crystal in a solution when the first generative process happens by chance. (2) The elements of a system are produced in the generative processes. The generative processes and the elements do not exist in a mutual causal relation but in a different dimension. The peculiar relation to the different dimensions is termed "Production". This situation is shown even at the level of say the instance where fog becomes a drop of water. (3) The produced elements operate in the generative processes again. The processes which are produced by these elements produce the next group of elements. This situation is similar to the relation which is traditionally called feedback or feedforward. (4) The continual operation between the generative processes and the elements forms a closed region automatically. This region is in a word, the self of the system. If an observer describes this self, the description entails somewhere a self-referential usage of words. Human languages subsist in lineal relation. If the observer defines the circular operation of system with lineal language, the definition entails a somewhat self-referential representation. The fundamental non-adjustment between operational circularity and the linearity of language brings about the problem of self-reference. (5) The produced elements make the particular place where elements exist. The generative processes appear in a specific space, that is, in a topological space. As a result, the system as a network of processes exists in this peculiar space. The true form of system consists in continuation of the movement, and then the movement comes to exist in the specific space which the produced elements specify.

The first formulation of the mechanism of autopoiesis by Maturana and Varela is set forth as follows:

"An autopoietic machine is a machine organized (defined as a unity) as a network of processes of production (transformation and destruction) of components that produces the components which: (1) through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and (2) constitute it (the machine) as a concrete unity in the space in which they (the components) exist by specifying the topological domain of its realization as such a network." [2]

This less-refined definition is seemingly expressed in more difficult terms compared to the actual discussed content. It is not possible to understand these sentences, unless we untangle them first. Moreover, it is not a fully adequate or exact enough representation given the necessary condition of autopoiesis.

A rudimentary explication of this formulation runs as follows: (1) The system is a network consisting of the generative processes, but is not defined by the sets of elements contained therein. If we were to attempt to define the system by sets of elements, we would immediately face the problem of how the range of a set of elements might be

determined . If an observer defines the range, this definition is necessarily not going to be in accordance with the operation of the system but only an observer's definition. Moreover, the system cannot be defined under the categorical relation of elements - compound when we understand the system according to the conception of autopoiesis. The formulation by Maturana and Varela shows how the range of the sets of elements is decided through the operation of the system itself.

(2) The elements are produced by the system. If we take now up the cell as an example of this system, the proteins which are the elements of the cell will be consumed for a certain period (about 100 days on average), and then produced again. Thus we cannot presume the identity of the elements. The elements are necessary to the mechanism in which the system continues to operate but at the same time the elements are produced and consumed repeatedly.

(3) The produced elements re-operate the system that is to say they are integral to the continuation and development of the system. To regenerate the system means to further the network of movements that are the system. From the point of view of the system, the system produces its own movement by using the elements produced. On the other hand from the point of view of the elements, the elements drive the system which produces elements. The system keeps operating by capitalizing on the produced material elements. This is the first feature of the system's components.

(4) These elements occupy a place in a specific space. In a sense they made the particular place where they exist. In the other words, the system realizes itself in the space that is projected by the elements. If elements are proteins, the system, that is, a cell, realizes itself in a physical space. If the elements are ones of communication, the system, that is, a social system, realizes itself in a social topological space. Elements specify each topological domain. This is the second feature of the systems components. This enlargement of the discourse relating to topological space has been executed by Luhmann.

The formulation by Maturana and Varela is set in the movements of the system. However, there are some problems which become immediately apparent even if we limit our examination within the mechanism of continuous movement.

The first problem is as follows: the components of the system are not same as the elements produced by the system. When for example macromolecules, the proteins, are definitely the components of the cell system, the cell system produces proteins and then proteins regenerate the cell system itself. However, it happens that the produced proteins are often not the same proteins and may be foreign matter. If elements are produced by the system, and then do not re-operate the system and do not enter into the circuit of the continuous movement of system, they do not become components of the system. Therefore, in such case waste elements are sometimes accumulated in the cell system. When entering the circuit of continuous movement, the produced elements become for the first time the components of the cell system. Only the produced elements

which can re-operate the system further become the components of the system. With these elements the system continues to operate, and in this sense the range of components is decided anew at each stage. The set of components is decided in each case by the continuous operation of the system.

The second point is as follows. In the formulation of Maturana and Varela, it is assumed that the system realizes itself in the space which the components specify and indicate. However, it is not easy to imagine that each individual component forms the space where it exists. According Maturana and Varela, if a component is a macromolecule, a physical space corresponding to a macromolecule is assumed, and according Luhmann, if a system is a social system, the topological space corresponding to communications is assumed to exist beforehand. In this conception they assume first the components themselves and then secondly the topological space corresponding to the components. This mode of understanding is determined by popular scientific paradigm in which we can first designate a kind of topological space and then observe the realization of a system within it. This topological space is constructed in this instance by none other than the observer. It is not, it should be noted, formed by the operation of the system. Luhmann's work also utilizes this scientific schematization; the topological space is for the observer (for us), not for the system (for itself).

In response to Luhmann's thesis we might in fact ask when will the topological space for itself be formed? If the topological space corresponding to the systems components cannot be assumed beforehand, it would be necessary for the system itself to form this topological space through its operations. When the components produced by the system form a kind of circularity through interrelations between components, then through this there is the formation of the real boundary which divides the real outside and the real inside of the system; a topological space for itself is formed for the first time.

In general, the formulation of autopoiesis shows the open circulation between the system which produces components and the produced components which re-operate the system. The circular operation at this stage might be called Sich, which is similar to 'the self before the self', and it consists of continuous movements. However, the produced components occupy a particular area. The space which the components occupy becomes the topological space. The real boundary of the system is formed with through the relationship with the components. Because in this case the system realizes and exists in a specific space, this self-enclosement by a boundary might be called Selbst (the self). However this is not yet the self which may be likened to the ego and the subject. Indeed the self (Selbst) in the conception of autopoiesis includes in fact both of these selfhood aspects i.e Sich as well as Selbst or Itself as well as self. Sich is purely the moving unit, and Sich is repeatedly produced through continuous movement on the one hand whereas Selbst exists in the specified space formed by the interaction of components. This Selbst divides the topological space into the real inside and the real outside through the interconnection of components and properties of the components. Selbst has

both movement and cognition. When the interrelations between components are formed, and with it the topological space is formed, the original characteristic properties that are manifest between the various components emerge. For instance water forms its volume through the movement of molecules. The volume of motionless molecules comprises about 5% of the volume of water. The molecules form the actual volume of water through their continuous motion. The topological area of the system is not only determined by productive operation but also by the movement and physical properties of the components. At this stage primitive cognition begins to appear in the system. Selbst is formed in the mutually non-determining movement and primitive cognition. In fact in this way various types of double operation emerge in Sich of the system.

I would like to reformulate the definition by of autopoiesis given by Maturana and Varela by attempting to give answers of the above-mentioned two problems, namely on the one hand the difference between elements and components and on the other hand the way the system itself constructs its own topological space. I believe this reformulation represents a clarification and development of the real mechanism of autopoiesis. I now turn to this reformulation.

" An autopoietic system is a system organized (defined as a unity) as a network of processes of repeated production (transformation and destruction) of elements. (1) When the elements re-operate continuously the network of processes (relations) continue which produced them through their interactions and transformations, these elements become the components of the system. Through continuous operation the range of components, that is to say Sich, is formed at each time. (2) When the relationship of the components produced by the network of processes makes a closed region with interactions and properties of components, the network (system) becomes a concrete unit, and exists in a peculiar topological space that is formed by the relationship of components. At this time, the space that is the closed region (Selbst) continuously forms both an inside (the real system) and an outside (the real environment). This is the topological space of the system, and the topological space for the system itself."

Autopoiesis shows a kind of circuit of productive acts. In general, in productive acts, there is a target that should be achieved, as far as acts are executed according to some model like the example of the house that is made through seeing the cave. It is also possible that the productive acts might still continue without any reference to a model. In this event, the operations could advance into forming the self of the producer itself. In this case the situation should be named self-production (autopoiesis). The self is automatically formed, through the continuance of own acts; in this way the produced things are formed parallel with this formation of the self by itself. As far as the productive acts only continue to operate, and at the same time things are produced

independent of all causal relations, it may not be the case that the productive acts perceive the produced things as their objects. In such instances the produced things seem for us to be the by-products of the continuance of the operations. As far as acts operate by themselves on one hand, and on the other hand insofar as the by-products emerge in the operation at the same time, a typical type of the double operation emerges.

The following remarkable features should be noted through the application of this system theory to the bodily system.

(1) In the operations of bodily action, there is a unity to the operation. If we stop the act of blinking half-way through, our eyes are partly shut and partly open. But the incomplete blink does follow the operation and rather becomes another condition ie a grimace. This unit of the operation is a constituent of the operating system. The bodily system continues to operate through the repeated production of these units. When the unit of the operation is forcibly divided, the unit changes qualitatively, and then the pure movement, which Deleuze termed as `Intensity`, appears to perception. This intensity as the pure movement corresponds to the Sich in the autopoietic system theory. The 'Site of Reversible Destiny' always supplies us the opportunities of a new unit with which we could enter to a new operative circle and sometimes into an intensive operation.

(2) In the repetition of the similar action, we cannot make the same action as the continuance of the bodily operation. The infant who has started walking for the first time is forming the operative self (Selbst) with the action of walking, whenever he or she takes a step. The execution of walking is a formation of the operative self with each step. Therefore, it is not possible for him to walk the same one step, because it is part of the continuing formation the operative self that takes place whenever walking takes place. The action is at the same time (immer zugleich) a formation of the active self, and then the operation of the body is always a double operation, that is, both execution and formation. Deleuze's 'Difference and Repetition' is substantially based on this mechanism of an operative system. The 'Site of Reversible Destiny' forces us to 're-form' our actions under the special conditions that reflect the experiences of an infant.

(3) In continuance of the bodily action, there are always choices for operation at the locus between one unified action and the next unified action. One step of walking can connect with the next action of stopping, jumping, flying up, or squatting down. The sudden starting of the action without connecting the next action is called the 'Micro slip' in the theory of affordance. In the point of connection between one elemental action and another elemental action, there are a lot of possibilities for new connection that have not been executed yet. A new bodily action could be formed by realizing one of the possibilities and consequently be perceived as a new movement for observers. The 'Site of Reversible Destiny' leads us to notice these choices for new movement.

(4) In the continuance of bodily action, it seems that the continuance of elemental

actions always tends to advance in the most efficient way. A body cannot become something without a physical body. As for the movement with/against gravity, the action can correspond to walking, going up, getting off the stairs or riding a bicycle. Two actions connect according to the continuance of a consistent operation. This is more so the case than for example each action being formed through corresponding to something like a perceived object in the environment. Therefore, an elemental action does not correspond in the main to either inputs or to outputs.

(5) In this respect, there is no any similarity between the formation of knowledge according to analysis and synthesis and, on the other hand, to the formation of the body in the continuance of bodily operation. A body is formed as something like a prototype individual and as a result can make a free correspondence to its environment though its operation. The ability of both free operation and of being an individual subsist in a prototype-like individual. This universality of the individual cannot be understood in the manner of a universal function or a universal concept etc. The idea of this kind of universal that relates to this prototype-like individual can be seen in Goethe' theory of colors. He researched various modes of the emergence of colors according to some prototype principle. In a similar way the 'Site of Reversible Destiny' makes us notice other possibilities for the individual

(6) The formation of the body and the formation of sensation/perception are closely synchronized in such a way that the one gives the other a parameter of the operation of to the other though they both advance in their respective fashion in the process of the formation. This synchronization is called a coupling in the autopoietic system theory. Coupling means neither the interaction of two systems nor mutual foundation. What is used in Ryoanji in Nagi is none other than a special type of this coupling.

Through these considerations, we can understand that the works by Arakawa + Gins supply the place where the formation of the body and sensation/perception are brought to our attention. It is a place where we unavoidably form another experience as we enter the work and are then are forced to go out another way.

3 Mysteries of Ryoanji in Nagi

Each human being has in its environment gravity, light, and air etc. as part of their vital operation even though they cannot perceive these things as objects. Gravity and light necessarily have to do with the formation of the bodily operation and in its inner relations. Gravity and light have already penetrated into the formed body, and then exist for it in a way that is neither internal nor external. Even in the modern sciences we cannot make a synthesis between the system of movements and the system of gravity, and cannot formulate light and colors in an integrated formulation, and we cannot know gravity and light perfectly as objects of knowledge. In this case, gravity means partly the opacity of the body and light means a partially-visible brightness;

neither a particle nor a wave. This definition of light corresponds to the views of Aristotle, Goethe and Wittgenstein. We do not ordinarily perceive, feel, or think about gravity and light. Therefore we can call such gravity and light 'Transcendental Environment'. If we start to form our body and our perception again, we can feel both the changes in body and perception and environmental conditions such as said gravity and light. A place for the commencement of the re-forming of the body and perception is 'Ryoanji in Nagi—Architectural Body'.

A huge, white and slightly slanted cylinder appears for us suddenly in the background of the small mountains of Nagi-Town. (Refer to 4) The garden of Ryoanji is formed in this huge cylinder. This garden was originally laid out in Ryoanji in Kyoto-City in the 15thcentury under the influence of the Zen Buddhism. (Refer to 5) It is famous for being a classic Japanese rock garden and is constructed with innumerable white pebbles and an arrangement of 12 rocks of varying sizes. We can find and feel a perfect quietness, a relaxation of the soul and a calmness of mind in the original garden. But we will have the exact opposite experience in Ryoanji in Nagi.

The original plane garden is projected on to the cylindrical inner wall of the cylinder. The cylindrical garden is closed and exists through this closure. (Refer to 6) We perceive in the garden in Nagi several alien things such as garden stones jutting out horizontally, curved roofs on the curved wall as well as the curved ground. The world of the garden is defined completely before human sensation and perception cleave voluntarily and form their topological domain. This closedness forces us to receive its landscape as sensation and perception. Consequently it is necessary for the cleaving of sensation for some blank to operate as well as place for the repetition of operations to be 'found'. However in practice neither such blanks nor such spaces are to be found in this garden. The only possible mode of entering into and operating from origination points, i.e. landing sight is in fact to continually produce landing sight.

Perception can ordinarily acquire a bird's-eye view of its object at once and the scenery before one's eyes can be converted to the scene as seen from a helicopter. As far as we cannot establish some origination locus in a specific place in this garden, we cannot have any bird's-eye view, and then our perception cannot accomplish its function. At this time we are compelled to be brought back to the place where perception itself is originally emerging, forming and developing. This is the effect of Ryoanji in Nagi. For that reason in this place we can feel moreover a kind of nostalgia whose origin we do not know.

Here we are temptated to talk with the narrative of psychoanalysis and psychology. Accordingly, we step up through extremely narrow stairs into the closed garden in the cylinder, and we come back to the mother's womb through the berth canal. But this kind of understanding is such a simple interpretation about the garden as to be only talking metaphorically about a place that we have already forgotten. In fact this garden is obviously full of dangers, and never safe like a mother's womb.

Moreover, in the garden there are no steady posture points and no geostationary points for bodily action. This is because this huge cylinder is erected diagonally. The body formed in a place without geostationary point shifts at once to another formative process. Therefore, the formation of the body has to begin again repeatedly at the same time as it finishes this operation. Here it is necessary for us to form perception and structure bodily action over and over again without any presupposed conditions. Arakawa + Gins call such a place in general the "Place of omnipresence". But in Ryoanji in Nagi there is no end, no aim, no landing or even a starting point for formation. Although we are impelled to produce our body and perception over and over again, nonetheless we cannot understand what we produce nor we have already produced.

The ceiling and the ground other than the walls and roofs in Ryoanji in Nagi are colored with the red and the green on a zonal divide. The red and the green are harmonious to each other such that there cannot be some middle color between them. Although we see a yellow-green between yellow and green, and blue-green between blue and green, we cannot see some red-green between red and green. The word 'red-green' reminds sometimes us of some color like light brown or dark brown that is not a middle color. We cannot think about 'red-green', as Wittgenstein indicated in his "Remarks on Colour". A kind of collision happens to us in this sensation when the red and the green are set adjacently. This collision somehow gets out of control and it has been repeatedly used in pictures such as 'Nature morte au magnolia' (1941) and 'Intérieur rouge, Nature morte sur table bleue' (1947) by H. Matisse. In the endless collision between the green of the heaven and the red of the ground, the colors of the soil and the subfusc color of the moss on the rocks there is a mysterious feeling of security and calm.

Natural light penetrates from only the one side of the cylinder, and so the degree of brightness in the cylinder is differs subtly and continuously from one spot to the next. There is a gentle slope to the degree of brightness in the cylinder. With this slope, tones of colors change gradually and therefore innumerable different reds and greens appear to the eyes. Jan Vermeer made practical use of the gentle slope of brightness in different blues in the turban in his 'Jeune Fille au Turban'. Each degree of the brightness changes every moment according to the height of the sun during the day. Therefore the conditions for the formation of perception will be continuously changing.

There are two great mysteries realized in Ryoanji in Nagi in addition to the many detailed devices that provide the various opportunities for ineluctable formation of sensation, perception and body.

First, a mystery occurs in the following situation. The phenomenon of a self-subsistent life system, for example a cell, has been mapped in greater and greater detail with a microscope. As the accuracy and minuteness of the microscope is improved, the pattern of the movement of the cell can be drawn in increasing detail. But the cell acts, forms and maintains itself by itself and moreover we cannot observe these activities of acting, forming and maintaining as such. If the cell could see its own

appearance by itself, it would be surprised at the great gap between the activities that the cell just does and the appearance of the cell. Analogously, even if we design a building and draw its blueprint and build it, and then we live in the structure and start to form our experience, we are surprised by the gap between the appearance of the builing and the experience formed in the building. Maturana presents an excellent example of this situation.

‘ What occurs in a living system is analogous to what occurs in an instrumental flight where the pilot does not have access to the outside world and must function only as a controller of the values shown in his flight instruments. His task is to secure a path of variations in the readings of his instruments, either according to a prescribed plan, or to one that becomes specified by these readings. When the pilot steps out of the plane he is bewildered by the congratulations of his friends on account of the perfect flight and landing that he performed in absolute darkness. He is perplexed because in his knowledge all that he did at any moment was to maintain the readings of his instruments within certain specified limits, a task which is in no way represented by the description that his friends (observers) make of his conduct.’ [3]

Various issues are indicated here. There is the great gap between the situation that the observer catches and what happening in actuality. The one that continues acting of its own accord operates chiefly according to its activity to form an own self and to divide the own self from its environment. However this formation is not one that relates its own self to its environment. For this reason, the observer cannot understand the life system through an articulation of the relation of the life system to its environment. This problem has to do partly with the perspective of the observer. The relation between the observer's perspective and the subject’s has been a difficult problem in the philosophical tradition. The two perspectives are both logically and in a commonsense way different to each other. However, it can be thought that the perspective of the subject is integrated repeatedly into the observer's perspective through the subject's reflecting on himself. In this way the observer can get a wider and wider perspective and can capture himself in the world. This is a conception in which the formative process of the experience is described, and is already realized, for example by Hegel in his Phenomenologie des Geistes. Conversely we can take the view to think that a subject’s perspective can be neither translated into nor reduced to the observer's aspect. This latter approach is one that we can find in various phenomenologies and existentialisms. In the thought of Hegel, the gap between a subject and an observer is indicated and even conquered by the observer. On the other hand in the idea of phenomenology the same gap is not conquered, and then the peculiarity of a subject remains. But this peculiarity is indicated and stationed even by the observer in contrast to/against an observer. In the two cases, the possibility of the relation of them is not doubted and rather presupposed.

Ryoanji in Nagi takes away the possibility. What occurs in Ryoanji in Nagi exceeds

these both conceptions. The formative experience in Nagi' Ryoanji and the outside shape as seen by an observer have not anything like this underlying common aspect.

Secondarily, the formative experience that occurs in the 'Site of Reversible Destiny' in Yoro, especially in 'Critical Resemblance House', extend an existing acknowledgment of this observer-subject gap but only by enhancing and diversifying existing abilities. However, the experience formed in Nagi has seemingly no common points with this extending or diversifying perception. Here, an example of Maturana's must be cited.

'Let us suppose that we want to build two houses. For such a purpose we hire two groups of thirteen workers each. We name one of the workers of the first group as the group leader and give him a book which contains all the plans of the house showing in a standard way the layout of walls, water pipes, electric connections, windows, etc., plus several views in perspective of the finished house. The workers study the plans and under the guidance of the leader construct the house, approximating continuously the final state prescribed by the description. In the second group we do not name a leader, we only arrange the workers in a starting line in the field and give each of them a book, the same book for all, containing only neighborhood instructions. These instructions do not contain words such as house, pipes, or windows, nor do they contain drawings or plans of the house to be constructed; they contain only instructions of what a worker should do in the different positions and in the different relations in which he finds himself as his position and relations change. Although these books are all identical the workers read and apply different instructions because they start from different positions and follow different paths of change. The end result in both cases is the same, namely, a house. The workers of the first group, however, construct something whose final appearance they know all the time, while the workers of the second group have no views of what they are building, nor do they need to have obtained them even when they are finished.' [4]

The first program operates in with perception and thought, and is realized in their objects as it were. I think that the second program operates in bodily action and bodily exercise, and is realized in processes but not in objects of knowledge. It may be thought that the second program is projected into the first program in observer's perspective, but the possibility of this projection has only a mathematical or semiotic meaning.

This above mentioned situation suggests rather the gap between the rules of recognition and the rules of the acts that we cannot be overcome through our reflection on some theoretical matter. In this event, we may recognize something entirely different from what we might produce as a result and there may be no point of coincidence between the known something and the actual occurrence. It seems that recognition is always already too late to know the actual occurrence that takes place in the act. In this way two problems are brought out. One is how to formulate suitable rules for the act, and I think this formulation can be done in a similar way to the formulation of self-organization and autopoiesis. The other problem is how to elucidate the riddles of

Ryoanji in Nagi from this viewpoint.

Arakawa + Gins have positively dismantled the rules of recognition in an extreme environment through forcing upon the subject a special type of phenomenological reduction. They have built a place in which we must form our perception and bodily action with regards to the question of what and how humans can 'become'. However, when perception and action take place, each according to different principles, we are apt to integrate what has occurred in the process of the formation of bodily action into the subject's cognitive perception. This enacts a kind of cognitive dominance over the body, and is in general too humanistic. When the act of cognition manifests itself as a recognition, we are only able to understand the newly acquired recognition in our consciousness and at the same time learn to regulate our body. This typical mode of cognition and incorporation will usually necessitate some repetition of our actions and a perspective of the observer that will integrate the two kinds of principles. The former repetition of bodily action is impossible within the structure of Ryoanji in Nagi, and the latter kind of integration is also impossible within the logic of the autopoietic system theory. Ryoanji in Nagi has produced impossibilities in real possible spaces, and for that reason we cannot understand what we have done.

Notes

1, Maurice Merleau-Ponty, The Visible and the Invisible, Northwestern U.P., 1968, pp.248-9.

2, Humberto R. Maturana, Francisco J. Varela, Autopoiesis and Cognition—The Realization of the Living, D. Reidel Publishing Company, 1972, pp.78-9.

3, Ibid., p.51.

4, Ibid., pp.53-4.